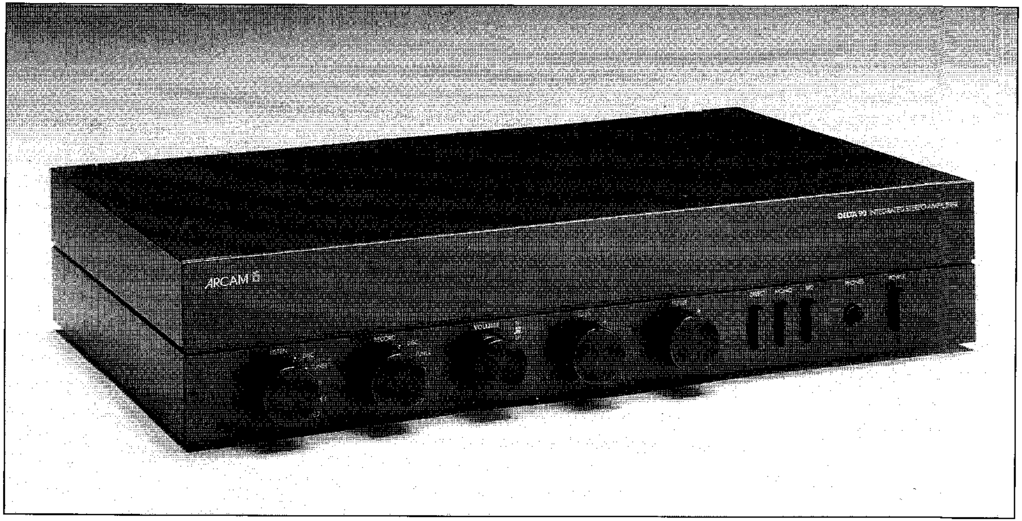
Audiophile products
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ARCAM



Delta 90.2 integrated amplifier handbook

Introduction

The Arcam Delta 90.2 integrated amplifier has been designed to meet the requirements of the most demanding listener. Combining excellent sound quality with sleek, sophisticated styling the Delta 90.2 will provide the heart of any high quality sound system.

The amplifier has five switchable inputs accepting signals from a compact disc player, turntable (with facilities for both moving coil and moving magnet cartridges), tuner and two tape recorders. There are independent controls for both the 'listen' and 'record' functions allowing the user to listen to one programme at the same time as recording another from an entirely separate source.

To increase further its versatility the Delta 90.2 is provided with a mono button, and high quality tone controls which have sensible amounts of boost or cut available at the frequency extremes. For the ultimate in audiophile sound quality these controls may be bypassed with the 'direct' switch on the front panel; nevertheless, used sensibly, they can help correct for many imperfections that may be present elsewhere in the audio system.

Please study this manual carefully to ensure that you get the best results from your amplifier. Remember your dealer is there to help you. He has full technical and service information for all Arcam products and considerable experience of their use in a variety of systems. If, however, he is unable to answer your query then do not hesitate to contact us directly.

Installing and using your Delta 90.2 Amplifier

Mains supply

The Arcam Delta 90.2 may be supplied to work on any of the following AC voltages: 110/220V and 120V/240V (100V units can be supplied to special order). Check that your local mains supply voltage agrees with the voltage setting indicated on the back panel of the Delta 90.2 If not, please contact the factory or your national distributor for details of how to proceed further.

A detachable mains lead is supplied with the Delta 90.2. The cores of this lead are coloured in accordance with the following code:

Green and yellow	– Earth
Blue	– Neutral
Brown	– Live

Note: Export units for certain markets have moulded mains plugs fitted as standard.

As the colours in the mains lead may not correspond with the coloured markings identifying the terminals in your plug proceed as follows:

The wire which is coloured green and yellow must be connected to the terminal in the plug which is marked by the letter E or to the safety earth symbol or coloured green or green and yellow. The wire which is coloured blue must be connected to the terminal which is marked by the letter N or coloured black or blue. The wire which is coloured brown must be connected to the terminal which is marked by the letter L or coloured red or brown.

Fuses

If the mains plug is fused fit a 5 amp fuse.

The AC supply inlet to the Delta 90.2 uses a standard IEC chassis mounting plug.

The IEC line socket on your mains lead and the IEC plug on the Delta 90.2 are a tight fit; before first using the Delta 90.2 it is therefore important to ensure that the socket is firmly pushed home into the chassis plug.

Under no circumstances should the Delta 90.2 cover be removed unless the supply is disconnected at the wall socket.

Notice

1 Please retain the carton and all packaging materials provided with this equipment so that it may be repacked correctly if it ever becomes necessary to transport the unit or to return it for service.

2 If servicing is required then the equipment should be properly packed and returned to the dealer from whom it was purchased. It is essential to include a covering letter giving your name and address and a brief but thorough description of the fault.

Connections

It is advisable that your system be switched off before connecting it up to the Delta 90.2. This will avoid possible damage to your loudspeakers. At the very least ensure that the volume control on your amplifier is turned down, or an unused input is selected.

Rear panel connections

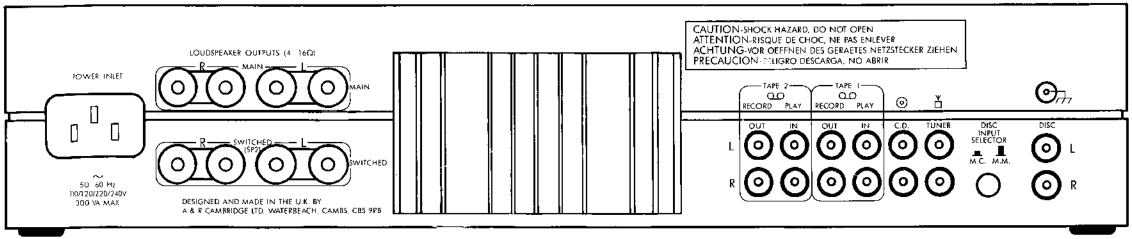


Figure 1

All audio inputs and tape outputs are via RCA phono connectors. All the phono sockets on the Delta 90.2 are marked 'L' for left and 'R' for right channels, with the left channels nearer the top of the cabinet. Your connection leads will be marked 'L' and 'R' or will have a white or black plug for left and a red plug for right.

Disc input

For the purposes of playing records the Delta 90.2 can accept both moving magnet and moving coil cartridges. For either type of cartridge the plugs on your turntable lead should be connected to the disc input sockets on the rear panel of the unit. A switch just to the side of these sockets allows the selection of either MM or MC input. The switch should be left out for use with moving magnet or high output moving coil cartridges and depressed for use with normal (low output) moving coil cartridges.

If your turntable has a separate earth lead then this should be attached firmly to the earth terminal on the rear of the amplifier.

Note

NEVER OPERATE THE MM/MC SWITCH ON THE REAR OF THE AMPLIFIER WITH THE VOLUME CONTROL TURNED UP AS THE RESULTANT ELECTRICAL SURGE MAY DAMAGE YOUR LOUDSPEAKERS.

Compact Disc input

This input is suitable for use with any compact disc player (and with our own Delta Black Box D/A converter coupled with a CD player). Connect your CD player to the amplifier using the phono sockets marked CD.

Note

Although, like the tuner and tape inputs, the CD has a 'flat' frequency response, its sensitivity is lower, to take account of the high output signals generated by CD players. It is possible to use either a tuner or another line source in the CD input but the amplifier's volume control will have to be turned up to obtain a volume similar to that found when using other inputs.

Tuner input

The tuner input is suitable for use with almost any AM or FM tuner. Connect your tuner to the amplifier using the phono sockets marked tuner.

Tape input/Output

The Delta 90.2 has connections for two tape recorders and is suitable for use with almost any cassette, reel to reel or video tape recorder:

1 connect the 'record' leads of your tape recorder to the phono sockets marked 'out' on the rear of the Delta 90.2 using phono/phono leads

2 connect the 'playback' leads of your tape recorder to the phono sockets marked 'in' on the rear of the Delta 90.2 using phono/phono leads.

Loudspeakers

The loudspeaker outputs are suitable for driving loudspeakers in the range 4—16ohms impedance. The heavy duty loudspeaker binding posts will accept almost any type of connector, i.e. bare wires, 4mm 'banana' plugs, spade connectors, pin connectors etc. A set of 4 suitable plugs is supplied as standard with the Delta 90.2. The Delta 90.2 has two sets of speaker outputs, marked main and switched (SP2). The main outputs, which offer a slightly superior sound quality to the switched, are suitable for use where loudspeakers are to be used alone or where loudspeakers and headphones are to be used at the same time.

The switched (SP2) outputs, in addition to the above, offer the possibility of using headphones only. The switched (SP2) outputs are operated by depressing the SP2 switch on the front panel of the amplifier. When the SP2 switch is depressed the operation of the switched outputs is identical to that of the main outputs. When the switch is out the switched outputs are off, allowing headphones to be used alone.

The switched (SP2) outputs also give the opportunity of using two sets of 8ohm impedance (or higher) loudspeakers with the Delta 90.2. By connecting one set of speakers to the main outputs and one to the switched and by depressing the SP2 switch on the front of the amplifier it is possible to drive both sets at once.

Loudspeaker connections

1 For both main and switched connections connect the negative side (usually black) of your left hand speaker to the black terminal of the two sockets marked 'L'. The other (the positive side or red) should be connected to the red terminal marked 'L'.

2 Repeat for the right hand loudspeaker.

Bi-wiring

If you are using, or are planning to use, a pair of loudspeakers which can be bi-wired, such as our own Arcam One+ or Two+ models, you can easily take advantage of this simple but very effective sonic upgrade with the Delta 90.2.

For each loudspeaker connect one pair of speaker cables, we suggest those running to the bass inputs on the speaker, to the main output for the corresponding channel on the amplifier; and one pair, we suggest those running to the treble inputs on the speaker, to the switched output for the corresponding channel on the amplifier. It will be necessary to depress the SP2 switch to enable the treble units to be driven.

Heatsink/ventilation requirements

The heat produced by the amplifier is dissipated into the air by the finned heatsink on the rear which will, along with the surrounding panel, become warm while the amplifier is on. The whole back panel may become quite hot if the amplifier is run near full power. This is perfectly normal. However, if it becomes too hot to touch, switch off the amplifier at once and consult your dealer. It is very important that there is adequate ventilation for the whole of the amplifier, but especially for the rear. It is also important to remember not to place records on top of it!

Front panel controls

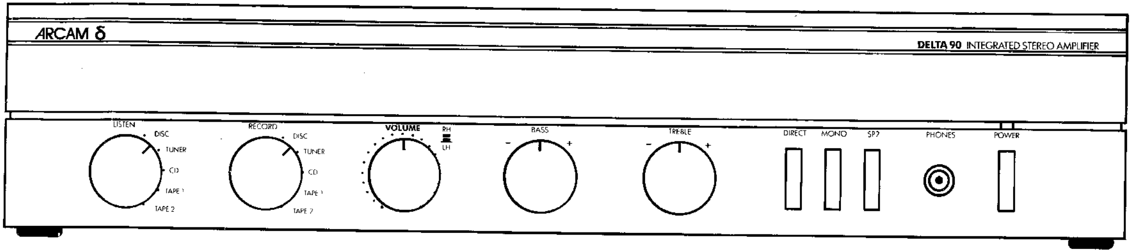


Figure 2

Power switch

The Delta 90.2 is turned on by depressing the power switch. The small rectangular LED (light emitting diode) above the switch will glow green. After several seconds you may hear a gentle click from inside the amplifier. This indicates that the speaker protection relay has been released and that the amplifier is ready for use. To turn the unit off depress the power switch again so that it unlatches. The green LED, which indicates that the dc power supplies within the amplifier are operating, will continue to glow for a short time after the unit has been switched off as the internal power supplies discharge.

Note

The Delta 90.2 will play music within seconds of switching on. However, in common with other audiophile products, the internal circuits take some time to stabilise fully and the very best sound quality may not be obtained until the amplifier has had a reasonable time (possibly up to an hour or two) to warm up.

Input selection

Input selection on the Delta 90.2 is divided into separate 'listen' and 'record' functions, controlled by two rotary knobs. This facility allows one input to be listened to whilst another is being recorded.

Listen

Select the input you wish to listen to by turning the knob to the desired point. The selected input should then be heard through your loudspeakers and/or headphones, with its level adjusted by the volume control on the front panel.

Record

The 'record' control is used to select the source required for your tape recorder. See page 8 for full details on tape recording and dubbing. The signals sent to the tape recorders are not affected by any of the amplifier's other front panel controls.

Volume control

The volume control is of a split type and allows you to adjust the levels of the left and right channels for both loudspeakers independently. Normally, the two halves of the control knob rotate together as they are locked by a friction clutch inside the volume control itself. However, by holding the rear part of the control firmly with the first finger and thumb of one hand, it is possible to alter the relative position of the two parts of the knob and thus compensate for level differences caused by the nature of the input signal or due to room acoustics.

Tone controls

The Delta 90.2's bass and treble controls have been designed to provide a limited but precise range of adjustment to the frequency extremes only.

The bass control permits some compensation for room or loudspeaker deficiencies without affecting the critical midrange frequencies. The treble control is particularly useful for correcting the frequency response errors of certain cartridges or for taming the apparently overbright sound of some compact disc material.

The bass and treble controls progressively cut their respective frequencies when turned anti-clockwise and boost them when turned clockwise. The flattest response for each control is obtained in the 12 o'clock position, conveniently and positively located by a centre click stop.

Direct

The direct switch is located just to the right of the tone controls. With the direct switch in the depressed position the audio signals completely bypass the tone control stages so that adjustment of the bass or treble controls will not alter the sound. If the tone controls are not often used then it is recommended that the direct switch be left in to achieve the very best performance.

Mono

The amplifier is in its normal stereo mode when the mono button is out. In this position, the left and right input signals are amplified independently to feed the corresponding loudspeaker outputs. When the mono button is pushed in the left and right signals are mixed together and the combined signal is routed to both loudspeakers. This is particularly useful when listening to mono records or tapes (as much low frequency out-of-phase rumble can be eliminated) or to remove excessive hiss from FM broadcasts. It is also invaluable for checking speaker phasing in a stereo hi fi system.

SP2 switch

When this switch is in the depressed position the output from the amplifier is channelled through the loudspeaker outlets marked 'switched', in addition to those marked 'main'. The 'main' outputs work all the time. If the SP2 switch is out no sound will be heard via loudspeakers connected to the 'switched' terminals. (See Loudspeakers page 5).

Phones

The headphone socket will accept any headphones fitted with a standard quarter inch (6.35mm) stereo jack plug. The headphones may be operated in parallel with the loudspeaker outlets, or not, as you wish (see Loudspeakers page 5).

Tape recording

The Delta 90 allows extreme versatility with tape recorders allowing you not only to record from one source but also to listen to another source at the same time. Both sockets are suitable for almost any type of recorder.

Tape 1

Connect your tape recorder to the Tape 1 sockets using the 'in' sockets for connecting the playback and the 'out' for connecting the recording side of your tape recorder (see page 5).

Recording – All the inputs are automatically connected to the recording outlets so to record an input, set the required input, e.g. CD, to play and then set the 'record' selector switch to the required input, CD in this example. Set your recorder into its recording mode and the required input will be recorded. Setting the 'listen' control to the recorded input, CD in this example, will enable you to listen to the input being recorded. If your tape recorder allows you to monitor the recording, switching to Tape 1 on the 'listen' selector will allow you to listen to the actual recording. If you wish to listen to another input, instead of either the recorded or the recording inputs, select the 'listen' selector to the desired input, Disc for example.

Playback – Set the 'listen' selector to Tape 1 and set your tape recorder in the playback mode.

Tape 2

Connect your tape recorder as per Tape 1 but using the sockets marked Tape 2.

Recording – All the inputs are automatically connected to the recording outlets so to record an input, set the required input, e.g. CD, to play and then set the 'record' selector switch to the required input, CD in this example. Set your recorder into its recording mode and the required input will be recorded. Setting the 'listen' control to the recorded input, CD in this example, will enable you to listen to the input being recorded. The Tape 2 sockets do not allow you to monitor the recording – **do not switch the 'record' selector to Tape 2 as this will cause severe feedback and may cause damage to your amplifier and your loudspeakers.**

If you wish to listen to another input, instead of either the recorded or the recording inputs, select the 'listen' selector to the desired input, Disc for example.

Playback – Set the 'listen' selector to Tape 2 and set your tape recorder in the playback mode.

Cartridge loading modules

These optional accessories are passive, switchable modules designed to modify the input impedance of the amplifier in order to obtain the best match with the cartridge in use. As the Delta 90.2 has a single set of disc inputs (switchable to MM or MC via the switch on the rear panel), then two separate loading modules – one for moving magnet (type ULM/M) and one for moving coil (type ULM/C) cartridges – are available on request from your dealer, distributor or the factory. These modules are user adjustable via a series of small switches.

The loading modules should be plugged into the amplifier on the pins located close to the disc input (see section – Removal of top plate below). A set of instructions is provided with each module. Care should be taken to ensure that only an MM loading module is used in conjunction with moving magnet or high output moving coil cartridges and that only an MC loading module is used in conjunction with normal (low output) moving coil cartridges.

Under no circumstances adjust the loading module switches when the amp is switched on and the volume turned up as severe damage may occur to your amplifier or speakers.

It must be emphasised that these passive modules mainly affect the sound balance and frequency response. They will have little or no effect on the sensitivity of the amplifier. Most cartridges will perform satisfactorily without any loading module.

Mains Fuse

All versions of the Delta 90.2 are fitted with an anti-surge mains fuse, rated at 1.25A for 220V and 240V models and 3.15A for 100–120V models. Just occasionally a mains fuse may fail, indicated by the amplifier appearing to be completely 'dead'.

A new mains fuse should only be fitted if you have no other reason to suspect that the amplifier may be at fault. (If the amplifier does appear to be at fault consult your dealer immediately).

The mains fuse is located in a holder close to the mains inlet. Always ensure that you fit a new fuse of the same type and value. You should find a spare mains fuse in the spares kit provided or, alternatively, fitted inside the amplifier close to the mains inlet.

If the new fuse fails we recommend that you return the amplifier to your dealer for investigation and possible repair.

It is ESSENTIAL to note the precautions detailed below.

Removal of top plate

Should you need to fit a new mains fuse or install a cartridge loading module, before removing the top plate ALWAYS SWITCH OFF THE AMPLIFIER AND DISCONNECT IT FROM THE MAINS SUPPLY.

Note that the mains fuse remains live whenever the amplifier is plugged into the mains, even when the amplifier power switch is in the 'off' position.

Before replacing a mains fuse the loudspeakers should also be disconnected. If after replacing the mains fuse and switching on the amplifier it appears to be working properly (i.e. not overheating, sounding OK on headphones etc.), then the loudspeakers may be re-connected – but only *after* turning the unit off once more.

To remove the top plate unscrew the two black headed screws at the top of the rear panel using a No. 1 'Posidriv' screwdriver. Then lift the top plate vertically and pull it backwards slightly to release it. Replacement is simply the reversal of this procedure.

Connecting cables

When dealing with high quality hi-fi systems, such as those based around a unit with the resolving power of the Delta 90.2, the question of connecting cables becomes of paramount importance. We strongly recommend that only first class loudspeaker and interconnect cables be used with your hi-fi system. We have found interconnect and loudspeaker cables from the AudioQuest 'LiveWire' range to be particularly suitable. Detailed information on the Audioquest range of cables may be obtained from your dealer or the factory.

As a rule of thumb you might budget to spend between 5% and 20% of the price of your system on cable. Surprising though it may seem this can be one of the most effective upgrades you can carry out on your system.

We suggest that you discuss the question of interconnect and loudspeaker cables with your dealer.

Check list

Should you have any difficulty in operating your amplifier, check the following before suspecting that a fault has developed.

No power and LED not illuminated. Check that:

1 the mains supply is connected and that the mains lead is fully home in the mains inlet socket at the rear of the amplifier

2 the mains is switched on and that the power switch on the front panel is depressed and has fully latched

3 the fuse in the mains plug has not blown and that the mains socket in the wall is live (test with another item/appliance).

Power on and LED illuminated but output from one loudspeaker only. Check that:

1 both loudspeakers are plugged into the correct amplifier outlets. Note, the amplifier may appear to play in mono if the loudspeakers are inadvertently plugged into the direct and switched outputs of one channel

2 both the left and right channels of the selected source are connected correctly and the input wiring is not faulty (check by swapping over the left and right input connectors)
If in doubt contact your dealer

3 one section of the volume knob is not set to minimum.

Loud hum heard through loudspeakers when disc is selected. Check that:

1 the ground lead from the turntable (if fitted) is connected firmly to the ground terminal on the rear of the amplifier

2 the amplifier is correctly earthed via the mains lead

3 your cartridge is not sited directly above your amplifier's transformer

(Move the amplifier away and check if the hum level changes).

4 other transformers in the vicinity are not radiating into the Delta 90.2.

Loud hum heard through only one loudspeaker when disc is selected. Check that:

1 the ground wire is not faulty within the respective channel's lead. This is easily checked by swapping over the leads and checking if the hum moves to the other channel

2 the headshell leads connected to the cartridge on the respective channel are not faulty or loose. If in doubt please consult your dealer.

Power on and LED illuminated but no output from the amplifier. Check that:

1 the amplifier is connected to the desired input and that the correct input on the amplifier is selected

2 the loudspeakers are connected correctly to the amplifier

3 if you have your loudspeakers connected to the outlets marked 'Switched (SP2)', that you have also depressed the switch marked SP2 on the front panel

4 the volume control is not set to minimum

5 if disc is selected, that the cartridge selector switch is set to the correct type of cartridge
NB *Do not operate this switch with the volume control turned up*

6 if CD is selected your machine is playing a CD.

Specifications

OUTPUT POWER	**Typical**
Both chs 8 ohms (20Hz to 20kHz, 0.5% THD)	70W
Single ch 8 ohms	85W
4 ohms	130W
Peak current delivery	±16A
Harmonic Distortion 60W, 8 ohms, at 1kHz	0.02%

FREQUENCY RESPONSE

Disc better than +0.3, −0.5dB from 40Hz – 20kHz, typ. −3dB at 20Hz

Line ±0.5dB 20Hz to 20kHz typ. −3dB at 8Hz, 50kHz

Tone Controls ±6dB maximum at 20Hz, 20kHz. (Fully bypassable)

INPUTS

Disc

Moving Magnet	
Sensitivity	2 mV
Noise (CCIR)	−59dB
Input Impedance	47k ohms/100pF
Overload Margin at 1kHz	37dB

Moving Coil	
Sensitivity	190 μV
Noise (CCIR)	−50dB
Input Impedance	220 ohms/600 pF
Overload Margin at 1kHz	37dB

Tuner, Tape 1 + 2

Sensitivity	140 mV
Noise (CCIR) ref. 1W output	78dB
Input Impedance	20k ohms
Overload Margin at 1kHz	50dB

CD

Sensitivity	260 mV
Noise (CCIR) ref. 1W output	78dB
Input Impedance	6k ohms
Overload Margin at 1kHz	50dB

OUTPUTS

Tape 1 and 2

Nominal output	140 mV
Output impedance	2k ohms
Crosstalk all inputs	−65dB at 1kHz
Size	430mm wide, 90mm high, 308mm deep (including knobs and heatsink).
Weight	6.5kg Net 8kg Packed